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Pittsburgh-Tuskegee Prostate Training Program

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Table of Contents

	<u>Page</u>
Introduction.....	3
Body.....	3
Key Research Accomplishments.....	4
Reportable Outcomes.....	4
Conclusion.....	4
References.....	N/A
Appendices.....	
SOW from proposal	9

## PITTSBURGH TUSKEGEE PROSTATE TRAINING PROGRAM

Alan Wells (Pittsburgh), Timothy Turner (Tuskegee)

### INTRODUCTION

We proposed an extended training program for college undergraduates that aims to build a cadre of young investigators of color in prostate cancer. Prostate cancer disproportionately afflicts African- American men; this increased incidence is compounded by issues of access to and utilization of healthcare resources. As such, we feel that it is critically important to recruit researchers from this population if we are to conquer this disease. Numerous programs have attempted to recruit minorities to biomedical research and prostate cancer in particular. Often this involves a short period of research immersion during a summer semester. However, it has been shown that many of these trainees do not persevere in the selected area due to the singular nature of the experience. We hypothesized that this combination of intensive summer immersions with ongoing academic year project extension will truly develop dedicated biomedical researchers in the area of prostate cancer.

We proposed to test this hypothesis by designing an undergraduate research training program in prostate cancer that starts in the home college at Tuskegee University, immerses the students for 10 weeks in a specific research project with mentors at the University of Pittsburgh, and then continues the research after returning to Tuskegee under the aegis of a collaborating mentor. Thus, the student is to undertake the research over a one- to two-year period allowing the student to partake meaningfully in the full cycle of research – thesis generation, experimental planning, experimentation, presentation, and writing and publication. Thus, students will be recruited and selected at the beginning of the year, develop a project that involves collaboration between mentors at Pittsburgh and Tuskegee, take course that contribute to the project prior to the summer, initiate that project in depth at Pittsburgh, and then return to Tuskegee to continue the work as independent study, and communicate the findings at national meetings and in the literature. This extended involvement not only benefits the trainee but also forges collaborations between individual faculty members at the two different institutions. This should provide for further avenues that facilitate mainstreaming and integration of training and research for other undergraduate, graduate and post-doctoral trainees.

### BODY

The accepted Statement of Work (attached) described a series of tasks to accomplish the Goals of this training program. However, given the later funding date of May, the timeline for the tasks was changed so that the interim annual reports were offset. However, all six years (original funding and renewal) were completed. All of the tasks were accomplished.

### KEY ACCOMPLISHMENTS During the renewal three year period

- Ø Nine (9) new student trainees participated in the summer program (Table 1)
- Ø Four (4) of the trainees returned for a second summer
- Ø All completed the summer training successfully
- Ø The new trainees established/continued ongoing research activities at Tuskegee
- Ø All the trainees presented posters or talks at a national meeting (Table 2)
- Ø Three different trainees were recognized with awards at the national meetings
- Ø A project has progressed to a published paper (Table 3)

### REPORTABLE OUTCOMES

Abstracts – see Table 2.

### CONCLUSIONS

This renewed training award has successfully reached defined milestones.

Importance/Implications: The Key Accomplishments above firmly demonstrate the ability to maintain a summer training program that has continuity with the home HBCU and the summer program itself. The outcomes over time will test whether this produces trainees more committed to research and/or prostate cancer than the usual one summer session disconnected from the home institution.

Recommended changes for future efforts: The feedback from the trainees and mentors is that there is a learning curve during the first half of the summer program. Thus, the momentum gained during the last month of summer training needs to be seamlessly transferred to the promise of to return the second summer, but of leading to a publication.

A second feedback is that the DoD summer program funding has not maintained competitiveness with other federally funded programs available for summer experiences at Tuskegee. As these other programs do allow for prostate cancer research in addition to other types of studies, the DoD PTPTP was not longer the preferred program. The DoD needs to address stipend level and transportation funding.

Table 1. Student trainees and mentors

Student	Project Title	Pitt Mentor
Datiri, Yeipyeng	Exploring the Role of PSMA and Folate in Prostate Cancer and the Novel Localization of PSMA to the Mitochondria	Denise O'Keefe
Myers, Kimberly	ERK MAPK Activity Coincides With Prostate Cancer Cell PC3 Mesenchymal to Epithelial Transition	Alan Wells
Smith, LeeKira	Effects of ELL2 Loss in Murine Prostate on Vascularity	Laura Pascal
Cainon, Ashley	Inter-differentiation of immune regulatory cells in prostate cancer	Michael Shurin
Davis, Miles	Cell Cycle G2/M Arrest by Inhibition of Protein Kinase D through Anti-proliferation Activity of SD 208 in Human Prostate Cancer Cells	Jianhua Luo
Jacob, Devin	Examining the Effects of Prostate Specific Membrane Antigen (Psm) and Folate Levels on Gene Expression and Proliferation in Prostatic Cancer Cells	Denise O'Keefe
Fields, Kristen	A Study of the Effect of DHT on Retinoblastoma Protein Expression in a Human Castration Resistant Prostate Cancer Cell Line, C4-2	Zhou Wang
Foster, Amber	Regulation of Steroidogenic Enzymes in Prostate Epithelial Cells by Prostaglandins	Don DeFranco
Hayes, Lamonne	The Role Copy Number Variations Play in Prostate Cancer	Jianhua Luo

**Table 2. List of student abstracts presented at meetings during the program.**

<b>Student</b>	<b>Abstract</b>	<b>Meeting</b>
Cainion, Ashley (2014)	Prostate Cancer Innervation: Development of an Experimental Model System	Annual Biomedical Research Conference for Minority Students, November 12-15, 2014, San Antonio, TX <b>(**Travel Award Winner**)</b>
Fields, Kristen (2014)	A Study of the Effect of DHT on Retinoblastoma Protein Expression in a Human Castration Resistant Prostate Cancer Cell Line, C4-2	Annual Biomedical Research Conference for Minority Students, November 12-15, 2014, San Antonio, TX
Davis, Myles (2014)	Determining Dosing for Hepatocyte Damage and Prostate Cancer Chemotherapies	Annual Biomedical Research Conference for Minority Students, November 12-15, 2014, San Antonio, TX
<u>Hayes, LaMonne</u> (2014)	The Role Copy Number Variations Play in Prostate Cancer	Annual Biomedical Research Conference for Minority Students, November 12-15, 2014, San Antonio, TX
Jacobs, Devin (2014)	The Effect of Chemopreventative Agent Withaferin A (WA) on Proto-Oncogene c-MYC in Bladder Cancer Cells	Annual Biomedical Research Conference for Minority Students, November 12-15, 2014, San Antonio, TX
Myers, Kimberly (2014)	The Role of Collagen on Mesenchymal to Epithelial Reverting Transition in Prostate Cancer Cells	Annual Biomedical Research Conference for Minority Students, November 12-15, 2014, San Antonio, TX
Cainion, Ashley (2013)	Inter-differentiation of immune regulatory cells in prostate cancer	Annual Biomedical Research Conference for Minority Students, November 13-16, 2013, Nashville, TN <b>(**Travel Award Winner**)</b>
Cainion, Ashley (2013)	Inter-differentiation of immune regulatory cells in prostate cancer	Tuskegee University Fourth Joint Annual Research Symposium (JARS), February 27-28, 2014, Kellogg Hotel & Conference Center, Tuskegee, AL <b>(**1<sup>st</sup> Place Poster Award Winner**)</b>

Cainion, Ashley (2013)	Inter-differentiation of immune regulatory cells in prostate cancer	Emerging Researchers National Conference, February 20-22, 2014, Washington, DC ( <b>**1<sup>st</sup> Place Poster Award Winner &amp; Travel Awards Recipient**</b> )
Datiri, Yeipyeng (2012)	Exploring the Role of PSMA and Folate in Prostate Cancer and the Novel Localization of PSMA to the Mitochondria	Tuskegee University Fourth Joint Annual Research Symposium (JARS), March 14-15, 2013, Kellogg Hotel & Conference Center, Tuskegee, AL
Datiri, Yeipyeng (2012)	Exploring the Role of PSMA and Folate in Prostate Cancer and the Novel Localization of PSMA to the Mitochondria	The National Conference on Undergraduate Research (NCUR), April 10-13, 2013, University of Wisconsin, La Crosse, WI
Datiri, Yeipyeng (2012)	Exploring the Role of PSMA and Folate in Prostate Cancer and the Novel Localization of PSMA to the Mitochondria	Annual Biomedical Research Conference for Minority Students, November 13-16, 2013, Nashville, TN
Davis, Myles (2013)	Cell Cycle G2/M Arrest by Inhibition of Protein Kinase D through Anti-proliferation Activity of SD 208 in Human Prostate Cancer Cells	Tuskegee University Fourth Joint Annual Research Symposium (JARS), March 14-15, 2013, Kellogg Hotel & Conference Center, Tuskegee, AL
Davis, Myles (2013)	Cell Cycle G2/M Arrest by Inhibition of Protein Kinase D through Anti-proliferation Activity of SD 208 in Human Prostate Cancer Cells	Annual Biomedical Research Conference for Minority Students, November 13-16, 2013, Nashville, TN ( <b>**Poster Award Winner in Cancer Biology Category**</b> )
Jacob, Devin (2013)	Examining the Effects of Prostate Specific Membrane Antigen (PsmA) and Folate Levels on Gene Expression and Proliferation in Prostatic Cancer Cells	Annual Biomedical Research Conference for Minority Students, November 13-16, 2013, Nashville, TN
Myers, Kimberly (2012)	ERK MAPK Activity Coincides With Prostate Cancer Cell PC3 Mesenchymal to Epithelial Transition	The National Conference on Undergraduate Research (NCUR), April 10-13, 2013, University of Wisconsin, La Crosse, WI
Myers, Kimberly (2012)	E-cadherin Increases in EGFR Knockdown DU145 Cells	Annual Biomedical Research Conference for Minority Students, November 13-16, 2013, Nashville, TN



Myers, Kimberly (2012)	The Role of miRNA200c on EGFR and E-cadherin in Prostate Cancer Cells	Tuskegee University Fourth Joint Annual Research Symposium (JARS), March 14-15, 2013, Kellogg Hotel & Conference Center, Tuskegee, AL ( <b>**1<sup>st</sup> Place Poster Award Winner**</b> )
Myers, Kimberly (2012)	E-cadherin Increases in EGFR Knockdown DU145 Cells	Emerging Researchers National Conference, February 20-22, 2014, Washington DC ( <b>**Travel Awards Recipient**</b> )
Royan Reddie (2012)	The Proliferation of DU145 Prostate Cancer Cells in a Pre-stressed Hepatic Niche	Emerging Researchers National Conference, February 20-22, 2014, Washington, DC
Smith, LeeKira (2012)	The Effects of ELL2 Loss in Murine Prostate on Vascularity or Angiogenesis Epithelial Defects	The National Conference on Undergraduate Research (NCUR), April 10-13, 2013, University of Wisconsin, La Crosse, WI
Smith, LeeKira (2012)	The Effects of ELL2 Loss in Murine Prostate on Vascularity or Angiogenesis Epithelial Defects	Annual Biomedical Research Conference for Minority Students, November 13-16, 2013, Nashville, TN

**Table 3. List of student co-authorships presented at meetings during the program.**

<b>Student Co-Author</b>	<b>Title</b>	<b>Journal</b>
Datiri, Yeipyeng (2014)	<i>"Novel nuclear localization of fatty acid synthase correlates with prostate cancer aggressiveness" was successfully entered into The American Journal of Pathology's online submission system". (Accepted for Publication)</i>	The American Journal of Pathology. 2014 Aug;184(8):2156-62.

## Statement of Work (SOW)

### **Year 1 (2012)**

December 2011 – February 2012, Tuskegee University sophomore trainees will be selected as “*Prostate Cancer Scholars*” for summer internship at the University of Pittsburgh.

February – April 2012, Trainees will be selectively paired with University of Pittsburgh Faculty mentors according to their research interests. Student-paired mentors from the University of Pittsburgh will be paired with Tuskegee University Faculty who are in similar areas of research or with similar research interests to facilitate the seamless continuation of summer research projects at Tuskegee University.

May 2012 – August 2012, Trainees will travel to the University of Pittsburgh to begin their 10-week prostate cancer research experience.

August 2012 - May 2013 Trainees will return from University of Pittsburgh, and continue their research training for the upcoming academic year under guidance of Tuskegee University Faculty Mentors. These *Prostate Cancer Scholars* will prepare and present communications at national meetings.

### **Year 2 (2013)**

December 2012 – February 2013, The second group of Tuskegee University sophomore trainees will be selected as “*Prostate Cancer Scholars*” for summer internship at the University of Pittsburgh.

February – April 2013, Second-year Trainees will be selectively paired with University of Pittsburgh Faculty mentors according to their research interests. Student-paired mentors from the University of Pittsburgh will be paired with Tuskegee University Faculty who are in similar areas of research or with similar research interests to facilitate the seamless continuation of summer research projects at Tuskegee University.

May 2013 – August 2013, Second-year Trainees will travel to the University of Pittsburgh to begin their 10-week prostate cancer research experience. First-year Trainees (**Class of 2012**) will be invited to return to the University of Pittsburgh to continue their prostate cancer research projects through one of its existing summer programs for undergraduates.

August 2013 - May 2014, Second-year Trainees will return from University of Pittsburgh, and continue their research training for the upcoming academic year under guidance of Tuskegee University Faculty Mentors. First-year Trainees (Class of 2012) will have completed two years of intensive prostate cancer training and their data will be put into manuscript form and submitted to a peer-reviewed journal for publication. Both Tuskegee University and University of Pittsburgh Faculty Mentors will monitor the publication process and advise Trainees in the application process to graduate programs. These *Prostate Cancer Scholars* and the ones from the prior class (Class of 2012) will prepare and present communications at national meetings.

### **Year 3 (2014)**

December 2013 – February 2014, The third group of Tuskegee University sophomore trainees will be selected as “*Prostate Cancer Scholars*” for summer internship at the University of Pittsburgh.

February – April 2014, Third-year Trainees will be selectively paired with University of Pittsburgh Faculty mentors according to their research interests. Student-paired mentors from the

University of Pittsburgh will be paired with Tuskegee University Faculty who are in similar areas of research or with similar research interests to facilitate the seamless continuation of summer research projects at Tuskegee University.

May – August 2014, Third-year Trainees will travel to the University of Pittsburgh to begin their 10-week prostate cancer research experience. Second-year Trainees (**Class of 2013**) will be invited to return to the University of Pittsburgh to continue their prostate cancer research projects through one of its existing summer programs for undergraduates.

August 2014 - May 2015, Third-year Trainees will return from University of Pittsburgh, and continue their research training for the upcoming academic year under guidance of Tuskegee University Faculty Mentors. Second-year Trainees (Class of 2013) will have completed two years of intensive prostate cancer training and their data will be put into manuscript form and submitted to a peer-reviewed journal for publication. Both Tuskegee University and University of Pittsburgh Faculty Mentors will monitor the publication process and help Trainees in the application process to graduate programs. These *Prostate Cancer Scholars* and the ones from the prior class (Class of 2013) will prepare and present communications at national meetings.